

## Patent Claims:

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Variable support structure with a modular construction consisting of at least one collapsible support structure module (91), which is bounded by joints (114, 115, 126, 121) of a first joint set, which are corner joints of the support structure module (91) and lie in a first surface, and by joints (101, 102, 113, 108) of a second joint set, which are corner joints of the support structure module (91) and lie in a second surface, and with at least one joint (109, 122) of a third joint set, which lies outside of the first surface, whereby at least a portion of the joints of the first and second joint set is fixable in its position relative to one another, especially connectable with one another, by a guide mechanism, characterized in that, one joint (109) of the third joint set is connected with at least two joints (114, 115, 113, 121) of the first and/or second joint set by a connecting element (39, 41, 43, 45) that transmits essentially only tension forces.

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2. Support structure according to claim 1, characterized in that a joint (122) of the third joint set is connected with at least one joint (101, 102, 113, 108) of the second joint set by a connecting element (40, 42, 44, 46) that transmits tension and compression forces.

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3. Support structure according to claim 2, characterized in that the at least two joints (114, 115, 113, 121) of the

first and/or second joint set and the at least one joint (101, 102, 113, 108) of the second joint set are connected with a common joint of the third joint set.

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4. Support structure according to claim 2, characterized in that the at least two joints (114, 115, 113, 121) of the first and/or second joint set are connected with a first joint (109) of the third joint set, and the at least one joint (101, 102, 113, 108) of the second joint set is connected with a second joint (122) of the third joint set, and in that the first joint (109) of the third joint set is connected with the second joint (122) of the third joint set by a connecting element (11) that transmits compression and tension forces.

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5. Support structure according to one of the claims 1 to 4, characterized in that the first and/or the second surface is a plane.

6. Support structure according to one of the claims 1 to 5, characterized in that all joints (101, 102, 113, 108) of the second joint set, and the joint (109) of the third joint set, which is connected with at least two joints (114, 115, 113, 121) of the first and/or second joint set by a connecting element (39, 41, 43, 45) that transmits essentially only tension forces, lie in one plane.

7. Support structure according to one of the claims 2 to 6, characterized in that all joints (114, 115, 126, 121) of the first joint set and the joint (122) of the third joint set, which is connected with at least one joint (101, 102, 113, 108) of the second joint set by a connecting element (40, 42, 44, 46) that transmits tension and compression forces, lie in one plane.

8. Support structure according to one of the claims 1 to 7, characterized in that the guide mechanism comprises guide means, and in that at least one joint (114) of the first joint set of a corner of the support structure module (91) especially arranged on the outer circumference of the support structure is connected by the guide means with a joint (102) of the second joint set of a neighboring corner of the support structure module (91) especially arranged on the outer circumference of the support structure, and a joint (101) of the second joint set of the corner is connected by the guide means with a joint (115) of the first joint set of the neighboring corner.

9. Support structure according to claim 8, characterized in that the guide means comprise connecting elements (15, 16) that transmit tension and compression forces and that are crossed-over and pivotally connected with one another.

10. Support structure according to claim 8 or 9, characterized in that the connecting elements (16, 32, 17, 20, 34, 21,

24, 36, 25, 28, 38, 29) that transmit tension and compression forces and that lead to supports of the support structure have a greater load capacity, especially a larger diameter, than the remaining connecting elements (15, 31, 18, 19, 33, 22, 23, 35, 26, 27, 37, 30) of the guide means.

11. Support structure according to claim 9 or 10, characterized in that at least a portion of the connecting elements (15, 16; 17, 18; up to 37, 38), which are pair-wise crossed-over and pivotally connected with one another and which transmit tension and compression forces, are connected with one another outside of their middle in the longitudinal direction.

12. Support structure according to one of the claims 1 to 11, characterized in that plural support structure modules (91, 92, 93, 94) are arranged next to one another, and in that neighboring support structure modules comprise common joints.

13. Support structure according to one of the claims 1 to 12, characterized in that the expansion of the support structure module (91) or the support structure (90) is adjustable by an operating arrangement.

14. Support structure according to claim 13, characterized in that the operating arrangement comprises expansion and retraction means, especially an expansion cable and a

4 retraction cable, which are guided in the respective joints  
5 over deflection means and are preferably fixably operable  
6 on a common joint (101).

1 **15.** Support structure according to claim 14, characterized in  
2 that the expansion cable (1) is guided in the respective  
3 joints over deflection means, especially deflection rollers  
4 or deflection saddles, with at least two different  
5 deflection radii.

1 **16.** Support structure according to claim 14 or 15,  
2 characterized in that the support structure (90) can have  
3 a pre-stress applied thereto by means of the operating  
4 arrangement, and thereby the support structure (90) takes  
5 on a prescribable form in a loaded condition.

1 **17.** Support structure according to one of the claims 1 to 16,  
2 characterized in that at least a portion of the joints (114  
3 to 121, 126) of the first joint set and/or of the joints  
4 (101 to 108, 113) of the second joint set and/or of the  
5 joints (109 to 112, 122 to 125) of the third joint set are  
6 connectable by a membrane in such a manner so that thereby  
7 an at least partially closed outer surface of the first or  
8 second surface is formed.

1 **18.** Support structure according to one of the claims 1 to 17,  
2 characterized in that at least a portion of the joints (114  
3 to 121, 126) of the first joint set and at least a portion

of the joints (122 to 125) of the third joint set are connectable with at least one, preferably triangular, panel element (201 to 216) in such a manner so that thereby an at least partially closed outer surface of the first surface is formed.

19. Support structure according to one of the claims 1 to 18, characterized in that the connecting elements that transmit tension and compression forces are articulately joined on the respective joints and are especially formed by rods of aluminum.

20. Support structure according to one of the claims 1 to 19, characterized in that the connecting elements that transmit essentially tension forces are attached, especially articulately joined, on the respective joints, and at least partially are formed by respectively two parallel extending wires or cables of steel.

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